Date : ..... Page : .....

Mine Sweeper

P1 ~~X~~ 2

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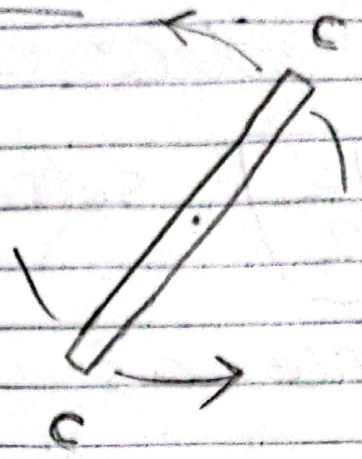
$\boxed{\text{main Case}}$

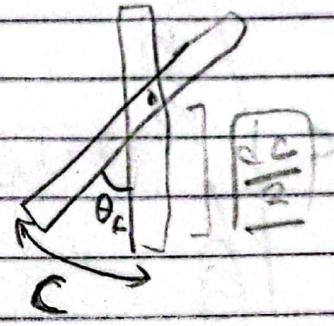
Cases



$$r = \frac{d_c}{\frac{c_2}{c_1} - 1}$$

$$r = \frac{d_c}{2}$$

$$r = -\frac{d_c}{2} \quad \text{(True)}$$



$$\boxed{\theta_f = \frac{2C}{d_c}}$$

$$\frac{d_c}{2}\,\theta_f = C$$

$$\boxed{\theta_f = \frac{2C}{d_c}}$$

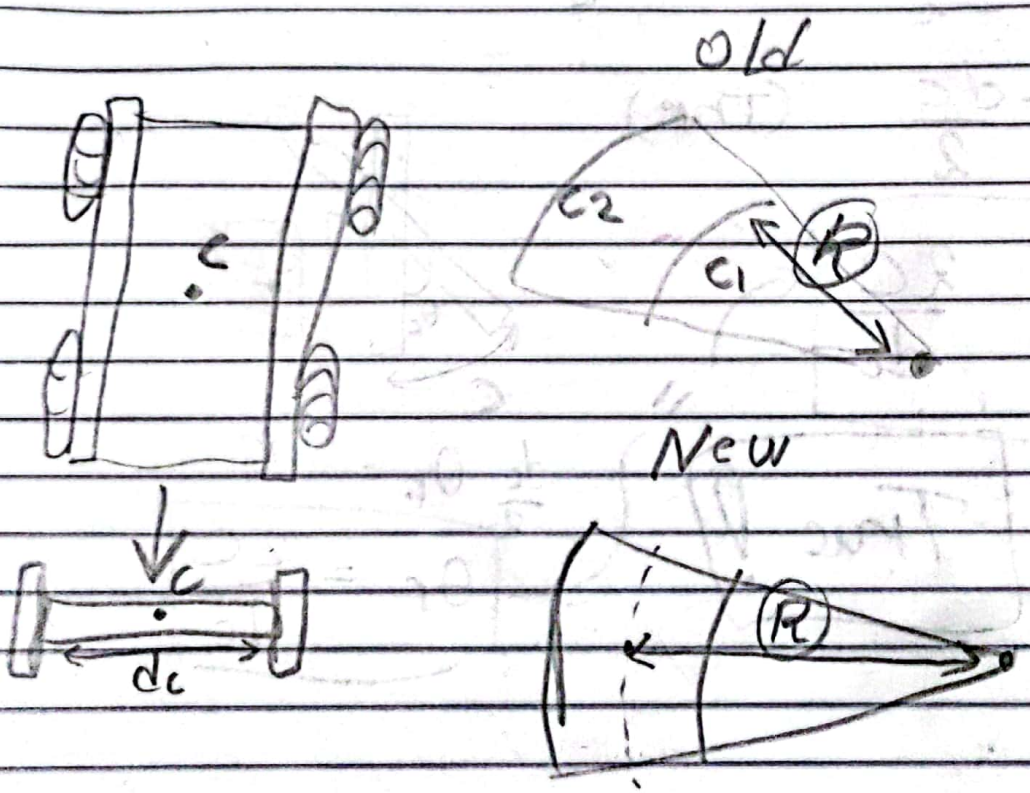
$\boxed{\text{True !}}$

Date : ..... Page : .....

Done to a dabt more? more simple ??

Adaptation :

we replace every r with $\boxed{r - \frac{d_c}{2}}$ setting the new refrence as robot center.



$$R_{new} = R_{old} + \frac{d_c}{2}$$

or $$R_{old} = R_{new} - \frac{d_c}{2}$$

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Date : ..... Page : .....

Old	New
$r_0 = \frac{d_c}{\frac{c_2}{c_1} - 1}$	$r_n - \frac{d_c}{2} = \frac{d_c}{\frac{c_2}{c_1} - 1}$
	$r_n = d_c \left(\frac{1}{\frac{c_2}{c_1} - 1} + \frac{1}{2} \right)$
$\theta_f = \frac{c_2 - c_1}{d_c}$	$\theta_f = \frac{c_2 - c_1}{d_c}$

All the other is the SAME but replacing

$r_0 + \frac{d_c}{2} \longrightarrow r_n$

$$X_{robot} = X_{in} + r_n \cos(\theta)$$

$$Y_{robot} = Y_{in} + r_n \sin(\theta)$$

same result but better approach?

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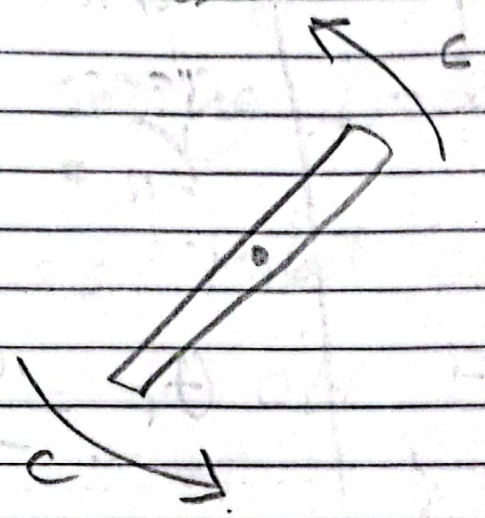
Date : ..... Page : .....

~~Straight~~

Case



Now

$r = 0$

$\theta_F = \frac{2c}{d_c}$

right?

yes

only the angle is altered

position is the same

$\Delta X = 0 \quad , \Delta Y = 0$

$\Delta\theta = \frac{2c}{d_c}$

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Date : ..... Page : .....

Straight Line Config.

Only apply when $C_1 = C_2$, not $C_1 \simeq C_2$, I think this is better.

alternate function.

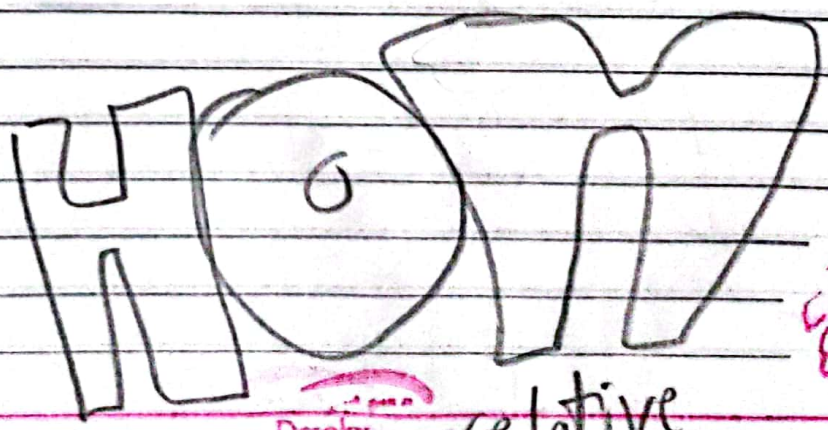
$\Delta\theta = 0$,

$X_{robot} = X_{in} + C \cos(\theta_{robot})$

$y_{robot} = y_{in} + C \sin(\theta_{robot})$

C in replace r ????

Lim?



relative center issue

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Date : ..... Page : .....

After

Some

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Date : ..... Page : .....

AFTER CENTER Corection

$$R_{ground} = dc\left(\frac{1}{\frac{c_2}{c_1} - 1} + \frac{1}{2}\right)$$

$$\Delta\theta_{ground} = \left(\frac{c_2 - c_1}{dc}\right)$$

$$C = \partial \times r_{wheel} \times \frac{n}{N} \times 2\pi$$

→ ∂ is direction
+ For ↱
− For ↳
or vice versa
(to be determined)

θ_{in}, X_{in}, Y_{in} is intialized and accumulated

$$\theta_{F_1} = \theta_{in_1} - \Delta\theta = \theta_{in_2}$$

$$Y_{F_1} = Y_{in_1} - R\cos(\theta_{in_1}) + R\cos(\theta_{F_1}) = Y_{in_2}$$

$$X_{F_1} = X_{in_1} + R\sin(\theta_{in}) - R\sin(\theta_F) = X_{in_2}$$

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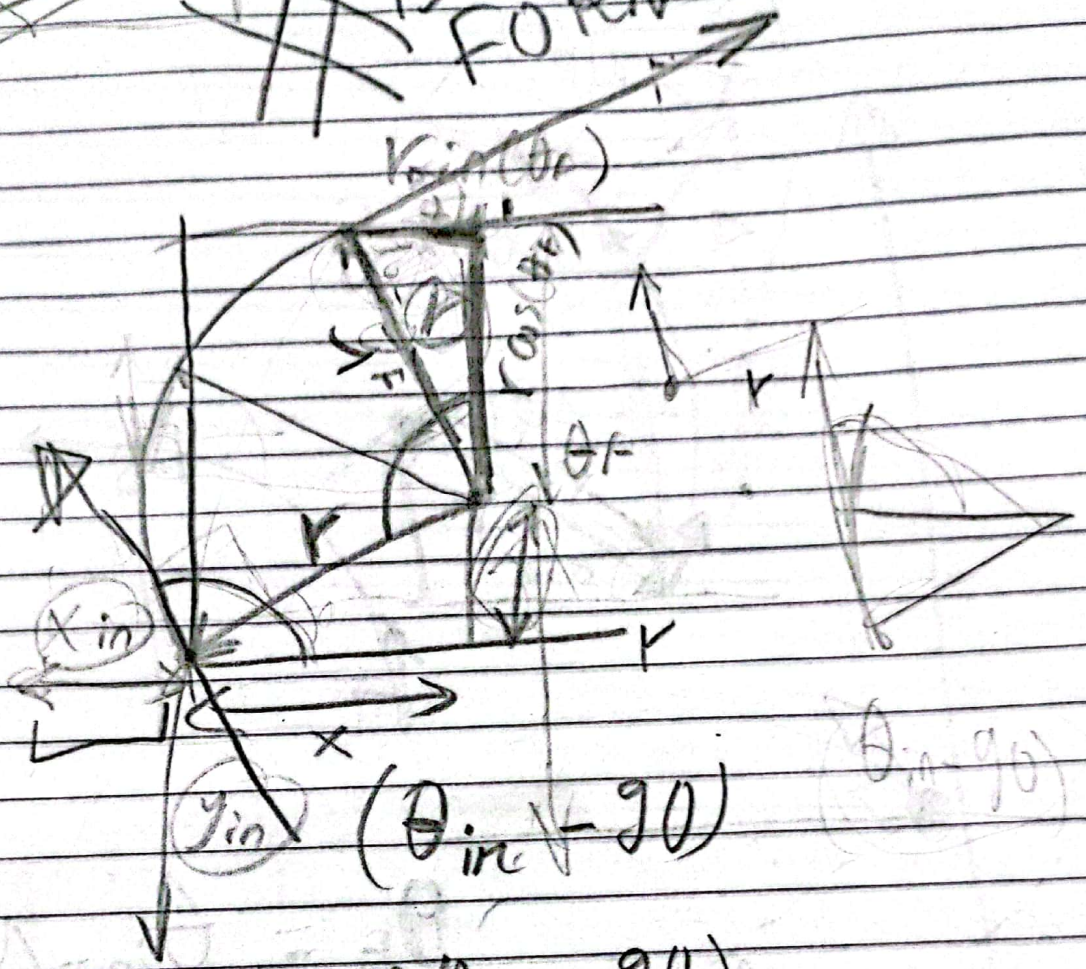
Date:

more Detailed FORM



$(\theta_{in} - 90)$

$r \cos(\theta_{in} - 90)$

$r \sin(\theta_{in} - 90)$

$(-\cos(\theta_{in}))$

$y_{center} = y_{in} + r \sin(\theta_{in} - 90)$

$\sin(\theta_{in})$

$X_{center} = X_{in} + r \cos(\theta_{in} - 90)$

Deepak

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more detailed form

Date : ..... Page : .....

$$y_{center} = y_{in} - r\cos(\theta_{in})$$

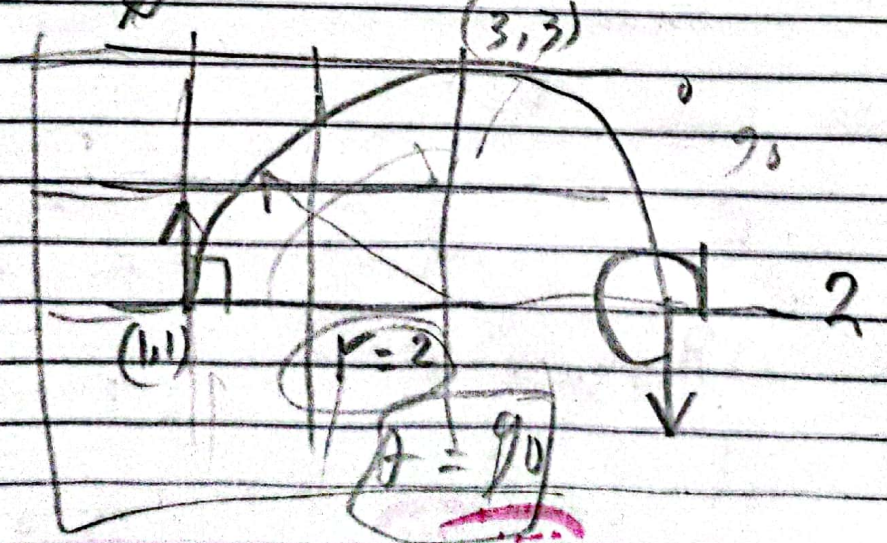
$$x_{center} = x_{in} + r\sin(\theta_{in})$$

$$y_{end} = y_{center} + r\cos(\theta_F)$$

$$x_{end} = x_{center} - r\sin(\theta_F)$$

$$y_{end} = y_{in} - r\cos(\theta_{in}) + r\cos(\theta_F)$$

$$x_{end} = x_{in} + r\sin(\theta_{in}) - r\sin(\theta_F)$$



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In Case of straight line Motion $C_1 = C_2 = C$

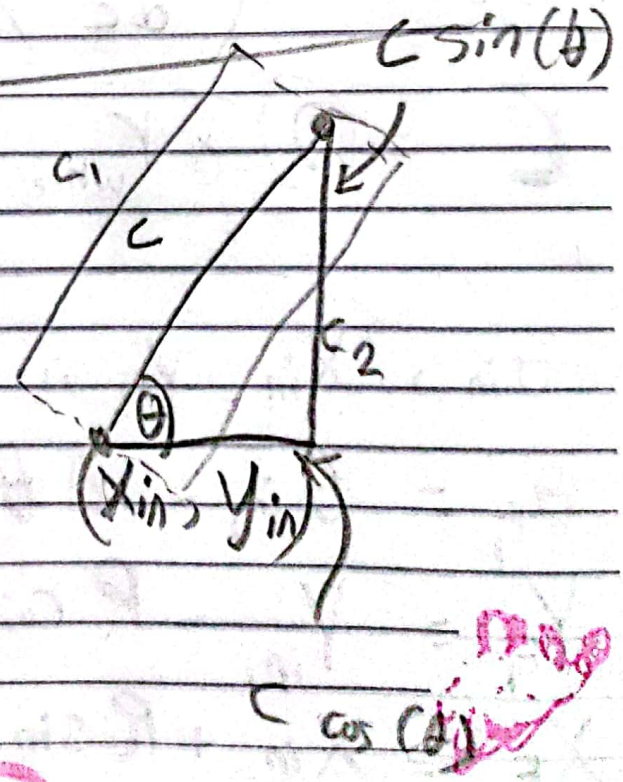
$$\theta_F = \theta_{in} + \Delta\theta \overset{\rightarrow 0}{=} \theta_{in} = \theta$$

$$Y_F = Y_{in} + C \sin(\theta)$$

$$X_F = X_{in} + C \cos(\theta)$$

2 approchs

$\lim_{C_2 \to C_1}$ From general Equation



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$$y = d\left(\frac{1}{\frac{x}{c}-1}+\frac{1}{2}\right)\left(\sin\left(\frac{\pi}{2}\right)-\sin\left(\frac{\pi}{2}-\right.\right.$$

$$y = d\left(\frac{1}{\frac{x}{c}-1}+\frac{1}{2}\right)\left(-\cos\left(\frac{\pi}{2}\right)+\cos\left(\frac{\pi}{2}-\right.\right.$$

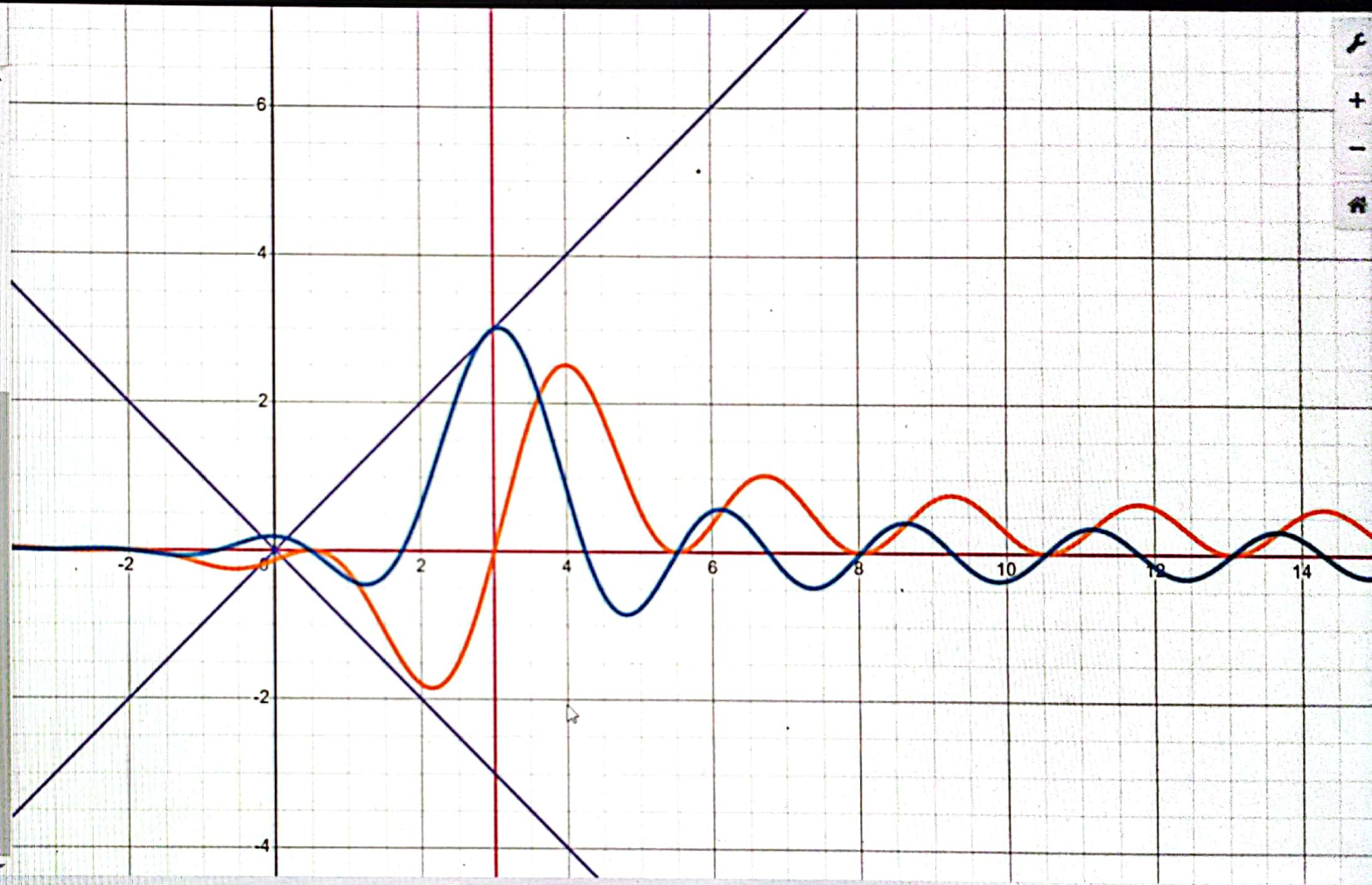
$$y = x$$

$$\theta_{in} = 1.5707963267948966$$

$-\pi$ π

$$y = d\left(\frac{1}{\frac{x}{c}-1}+\frac{1}{2}\right)\left(\sin(\theta_{in})-\sin\left(\theta_{in}-\right.\right.$$

$$y = d\left(\frac{1}{\frac{x}{c}-1}+\frac{1}{2}\right)\left(-\cos(\theta_{in})+\cos\left(\theta_{in}-\right.\right.$$



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